

**Summary of Perchlorate in Fertilizers and Plants, September 23, 1999****EPA, Office of Research and Development**

- Perchlorate ( $\text{ClO}_4$ ) is a chemical that has been found to contaminate ground and surface waters, where it is mobile and can persist for decades. A major source of contamination has been the disposal of perchlorate following its manufacture and use as a propellant for rockets and fireworks.
- EPA is currently assessing the risks posed by perchlorate. The perchlorate risk assessment is one major activity of the Interagency Perchlorate Steering Committee, which is made up of EPA, the Department of Defense, and a number of other federal, state, and tribal agencies. EPA's perchlorate effort involves a number of Agency offices, including the Office of Research and Development (ORD), Office of Solid Waste and Emergency Response, the Office of Water, and EPA Region 9 (Ariz.-Calif.-Hawaii-Nev.).
- Various perchlorate research projects are being conducted by EPA and others. As part of the research, scientists at ORD's National Exposure Research Laboratory (NERL) in Athens, Ga., have investigated the content of perchlorate in some commercial fertilizers. Nine brands tested each contained detectable levels of perchlorate. A communication highlighting these findings has been accepted for publication in the October edition of the journal *Environmental Science & Technology (ES&T)* and has been published on the journal's website. The Fertilizer Institute has raised technical concerns about ORD's findings reported in *ES&T*. ORD is exchanging scientific information with the Fertilizer Institute and other parties to shed light on the occurrence of perchlorate in fertilizers.
- ORD is currently participating in an interagency/industry joint investigation of perchlorate in fertilizers in light of the significant variations in perchlorate levels reported to date (potentially due to differences in raw materials and methods).
- Another of EPA's research activities is to investigate methods to remove perchlorate contamination. One method under study is phytoremediation – the use of plants to degrade or take up contaminants. As part of the research, ORD/NERL scientists have investigated different kinds of plants and found that their effects vary. Preliminary studies in the laboratory and greenhouse have found that some plants break down perchlorate (directly or by spurring degradation by soil microbes), while others – such as leaf lettuce and mustard – can take up perchlorate and accumulate it for a period of time in their leaves, stems, and roots.
- Additional experimental work is needed to confirm these preliminary findings. Further studies also are needed to understand the conditions under which accumulation may occur, determine what crops might be affected, and to improve methods for measuring perchlorate. Whether agricultural plants grown under typical field conditions accumulate perchlorate from fertilizers or irrigation water is not yet known. "Farm gate" studies (studies of crops leaving a typical field after a growing season) and analyses of specific contaminated sites to evaluate transport and transformation of perchlorate in different soil types are also needed.
- At this time, ORD believes that the fertilizer and plant-uptake studies are too preliminary to evaluate what risks, if any, perchlorate in fertilizers or plants pose to the public. ORD's findings may have implications for an additional route of exposure (food), and if so will be incorporated into the perchlorate risk assessment as it is revised. EPA currently expects to issue a draft of the risk assessment for a second external peer review in Fall 2000.

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